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Building methods and equipment

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In a method of making or enlarging an opening O in a wall W, a horizontal groove 4 is cut in the wall W to a depth which leaves a temporary support zone Z for the section of the wall W above the groove 4. A temporary lintel 5 is held against at least one side of the wall W, by means of bolts 9 passing through the wall W and the lintel 5, with a projecting supportive flange 6 of the temporary lintel 5 engaged in the groove 4. With the wall so supported a permanent lintel L is fitted.

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(54) Building methods and equipment

(57) In a method of making or enlarging an opening O in a wall W, a horizontal groove 4 is cut in the wall W to a depth which leaves a temporary support zone Z for the section of the wall W above the groove 4. A temporary lintel 5 is held against at least one side of the wall W, by means of bolts 9 passing through the wall W and the lintel 5, with a projecting supportive flange 6 of the temporary lintel 5 engaged in the groove 4. With the wall so supported a permanent lintel L is fitted.

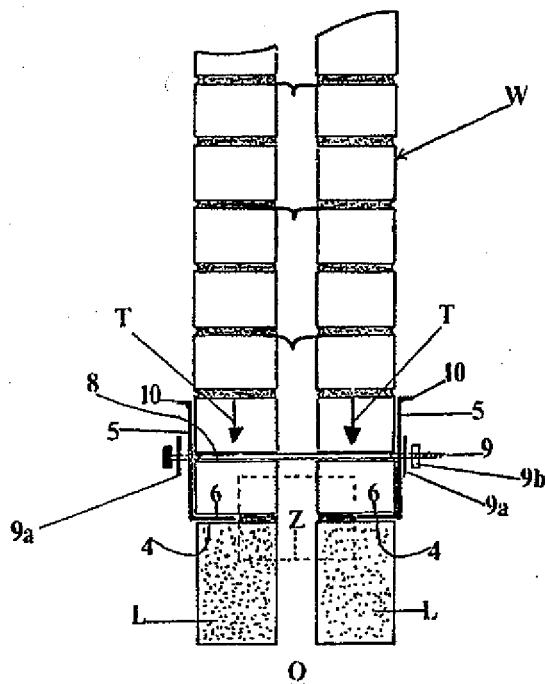


Fig. 6.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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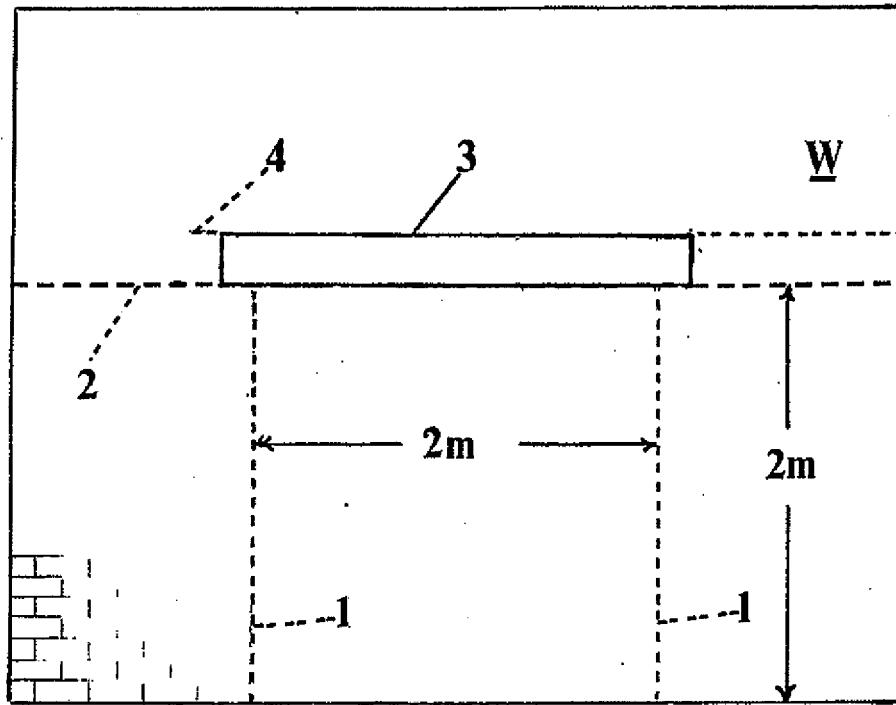


Fig. 1.

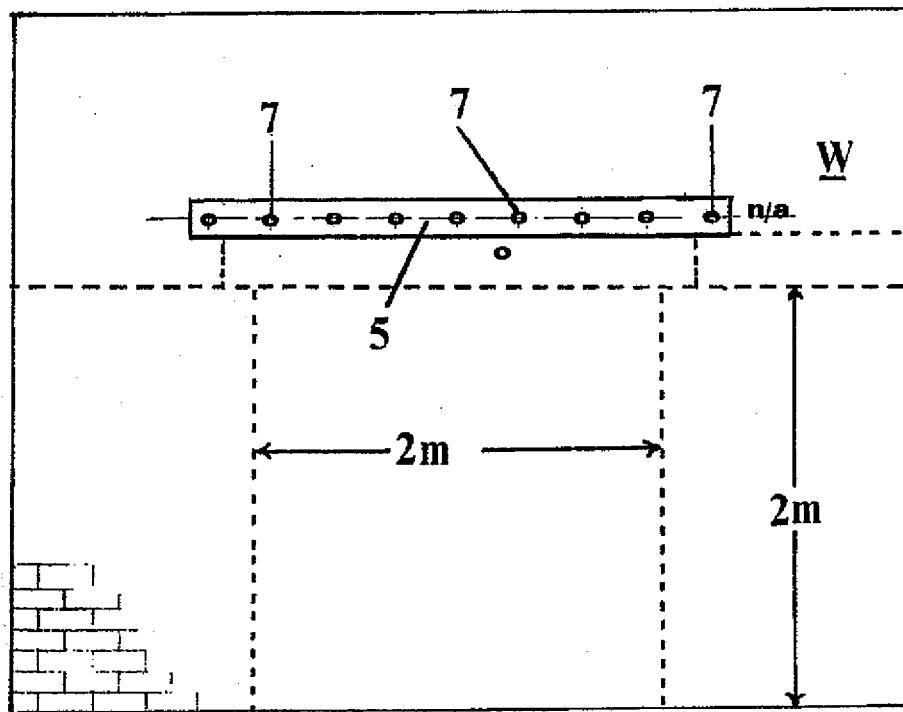


Fig. 2.

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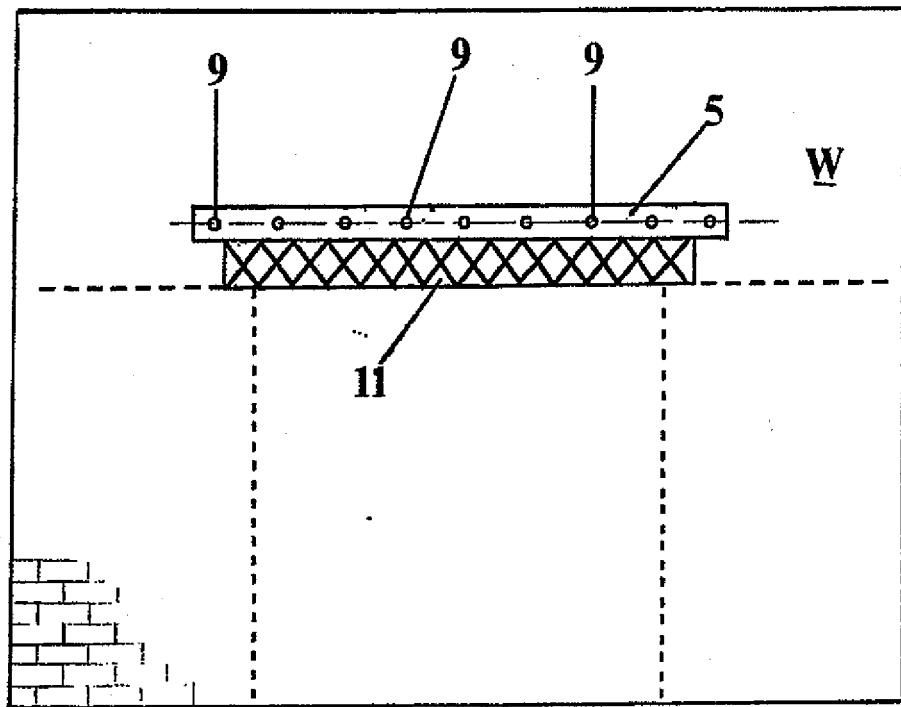


Fig. 3.

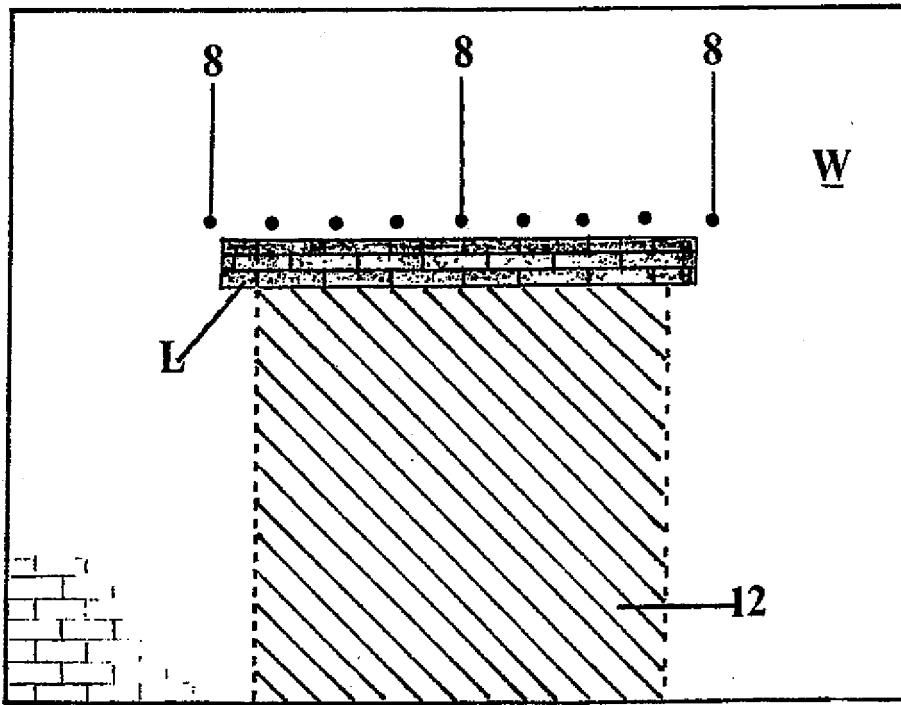


Fig. 4.

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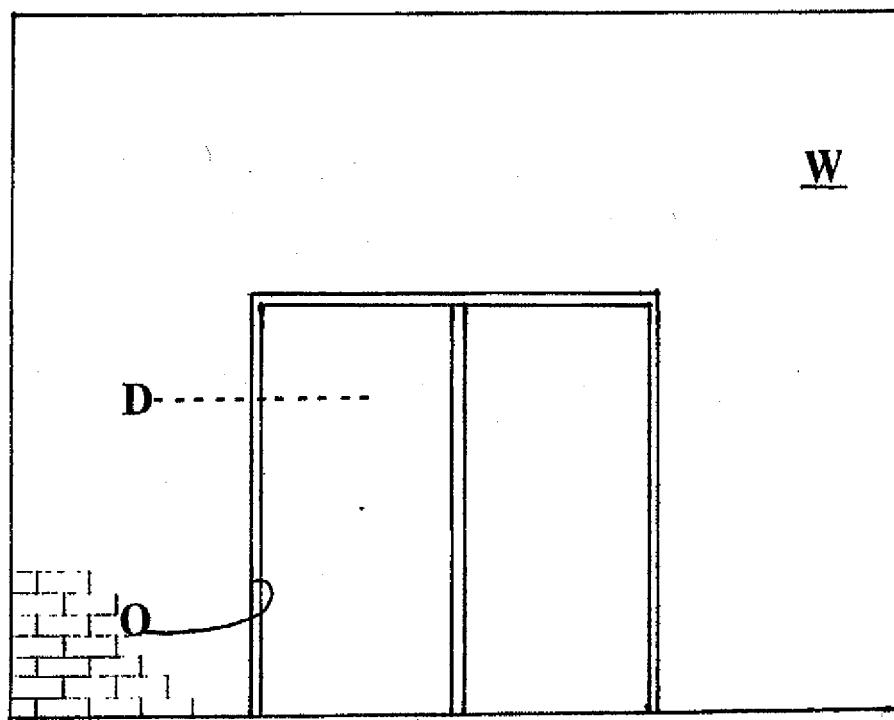


Fig. 5.

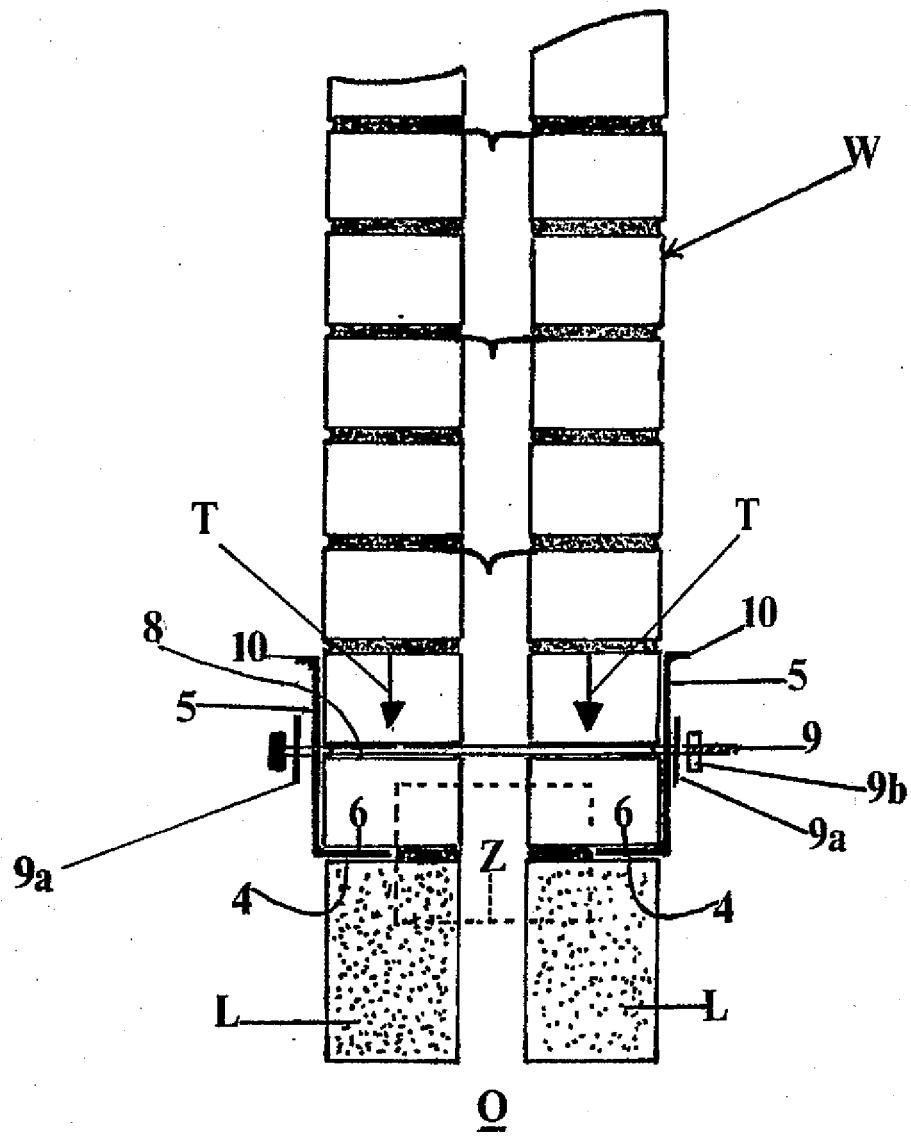


Fig.6.

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"BUILDING METHODS AND EQUIPMENT"

The invention relates to building methods, particularly a method applicable to the modification or renovation of an existing building, and to equipment for use therein.

It is often required to make or enlarge an opening through a masonry wall, for example of brick or stone construction, normally to provide a new or larger doorway or window opening. Temporary support has to be provided above lintel level as the hole is knocked through and a lintel installed in supportive position, and this is normally done by the so-called "needle and prop" method. A plurality of holes are made above lintel level through which short beams or "needles" are passed, and the projecting ends of the needles are supported on steel props of screw jack type.

The needle and prop method has several inherent disadvantages. The holes made to take the needles serve no other purpose and affect the integrity of areas which would otherwise be left intact. The props create an obstruction in the working area and they need to be located on a firm and stable base. Thus, it is often necessary to remove adjacent sections of flooring to allow the props to find firm support on the ground. The erection of scaffolding is

often necessary, particularly if the work is above the normal working height of the props.

An alternative method for making an opening in a brick wall has been proposed, in GB 2 131 076 A, which comprises cutting out a horizontal joint to the depth of a brick on one side of the wall, inserting the horizontal portion of an L-shaped elongate lintel member into the joint, drilling holes through higher bricks in the wall through apertures in the other limb of the member, similarly fitting a complementary elongate lintel member to the other side of the wall, and bolting the two lintel members together and then cutting out the desired opening below the lintels. The lintel members can be treated as a temporary lintel, being unbolted and removed after a permanent lintel has been fitted below them.

With this method the cutting of a groove to the depth of a brick removes all support for the bricks immediately above the groove, resulting in the possible instability of the wall during the interval between cutting out of the joint and insertion of the elongate lintel member therein. The same problem again occurs when that member is removed as there is then no support for the masonry above the newly installed permanent lintel, leaving the area potentially unstable. This situation exists until the support is reinstated in the void created by the removal of the temporary lintel. Furthermore, the holes drilled through the brickwork after being filled following

removal of the temporary lintel are a permanent blemish on the brickwork.

The invention enables an opening in a wall to be made, or enlarged, in a far more satisfactory manner than hitherto and without some or all inherent disadvantages of either of the aforesaid prior methods.

According to the present invention a method of making or enlarging an opening in a wall involves cutting a horizontal groove in the wall which leaves a temporary support zone for the wall above the groove and holding a temporary lintel against at least one side of the wall, by means of bolts passing through the wall and the lintel (or masonry fixing bolts), with a projecting flange (or other supportive projection or projections) of the temporary lintel engaged in said groove, and thereafter with the wall so supported fitting a permanent lintel. Preferably the permanent lintel is fitted prior to making the full width final opening through the wall.

When working on a wall which does not present continuous horizontal mortar joints which can suitably be chased out for engagement by the supportive flange of the temporary lintel, a suitable groove may be made in the masonry to receive the flange. References herein to a mortar joint are accordingly to be construed as covering such an alternative where applicable.

The temporary lintel preferably has a projection or projections engaging in the mortar joint below a course

of building elements, which will most usually be bricks, and a single supportive projection may take the form of a bottom edge flange extending the full horizontal length of the temporary lintel. The temporary lintel may have an oppositely directed strengthening flange along its top edge.

Preferably the temporary lintel member extends over the full width of the final opening and beyond each end of the permanent lintel to be installed. The method, when working on a cavity wall particularly, conveniently employs two temporary lintels clamped together with the wall between them to form a stable beam.

The invention also provides equipment in the form of said temporary lintels designed and adapted for use in the method of the invention. They may be supplied in a variety of suitable lengths, desirably with said bottom supporting and top strengthening flanges, and with clamp bolt holes which are preferably centred on the central neutral axis of the plates. For use with brick walls, the width dimensions are desirably such that with the bottom edge flange inserted in one horizontal mortar joint the bolt holes are in line with a mortar joint above. This facilitates fixing as the bolt holes can then easily be drilled through the mortar joint concerned. The bottom edge flange preferably has a width about or less than half the thickness of a brick, being say up to 50 mm wide. High tensile steel bolts of say 12 or 13 mm diameter are

desirably used, with over-size bolt holes of say 45 to 50 mm diameter to avoid registration problems.

The invention will now be further described with reference to the accompanying drawings which illustrate, by way of example, the method of the invention applied to the installation of a patio door in a brick wall, and the equipment used in the method. In the drawings:-

Figs. 1 to 5 illustrate stages in the installation of the patio door; and

Fig. 6 is a fragmentary cross-sectional view of the wall showing the equipment in use.

Fig. 1 of the drawings shows the brickwork wall W marked out by broken lines 1 indicating the side edges of the opening O to be made to receive the patio door D, and a broken line 2 indicating the height of the opening. The location of the permanent lintel L to be installed, immediately above the opening top level on the line 2, is drawn in by full line 3. The lintel L when installed in supportive position extends by 150 mm at each end beyond the respective sides of the opening O. In this example the overall width of the patio door D, and thus of the opening O, is 2 m.

After marking out in the foregoing manner a groove 4 is chased out along the mortar joint immediately above the permanent lintel location, as indicated by a broken line in Fig. 1 and shown in Fig. 6. The depth of the groove 4, as depicted in Fig. 6, is somewhat less than

half the thickness of a brick, say approximately 50 mm, leaving a major section of the mortar bed undisturbed to retain a temporary support zone Z supporting superior masonry, this support zone Z lying within the broken line boundary indicated in Fig. 6.

A temporary lintel 5 is then offered up, as shown in Fig. 2, so that a bottom edge flange 6 (see Fig. 6) of the lintel 5 is received in the groove at 4. The provision of the support zone Z ensures that insertion of the lintel 5 can be carried out under controlled stable conditions. With the temporary lintel 5 so positioned the positions of a single row of bolt holes such as 7 in the lintel 5 are marked out and the latter then removed. Bolt holes such as 8 to receive 12 mm high tensile clamp bolts 9 are then drilled through the wall W at the marked-out positions. The holes 7 are positioned on the neutral axis of the temporary lintel 5, so as not materially to weaken the latter, and the dimensions are such that the bolt holes 8 can be drilled through the mortar joint next above that in which the groove 4 was chased out to receive the supportive flange 6.

The wall W being a normal external cavity wall a temporary lintel 5 has to be fitted to each side of the wall, and the two temporary lintels 5 are clamped together (as shown in Fig. 6) with the wall W between them by the high tensile bolts 9, the nuts 9b of which are appropriately tightened. The lower edge flange 6 of each

temporary lintel 5 locates in the respective chased-out groove and directly supports the brickwork above it. Each temporary lintel 5 is of pressed metal form, typically pressed from 10 swg mild steel strip, with an oppositely directed upper edge flange 10 provided for strengthening purposes. The pressing is radiused at the flanges 6 and 10, to ensure fracture free bends, with a radius which may be of about 3 mm. The lintel depth is 155 mm, the width of the bottom flange 6 is 50 mm and the width of the top flange 10 is 12.5 mm, these foregoing merely being examples of typical dimensions. For shorter lengths of lintel the upper strengthening flange 10 may be omitted.

The bolt holes 7 in each temporary lintel 5 are oversize to avoid registration problems for the bolts 9 which are fitted with suitably sized plate washers 9a, and they desirably have a maximum centre spacing of 600 mm with this spacing being 300 mm in the example shown. The end bolt holes 7 are positioned 75 mm from the ends of the temporary lintels 5. The two temporary lintels 5 clamped together against opposite sides of the wall W together form a stable beam, supporting the brickwork above them. The brickwork in the space required for the permanent lintel L, shown cross hatched at 11 in Fig. 3, is next removed. The permanent lintel L is then set into supportive position as shown in Fig. 4, the temporary lintels 5 being removed and the face brickwork reinstated as may be necessary to suit the lintel L used. The bolt holes 8 are then filled and

the brickwork shown as a hatched area 12 in Fig. 4 below the lintel L removed to provide the final opening O.

Extraction of the temporary lintel is facilitated by reforming of the temporary support zone Z during the placing of the permanent lintel L. Once the mortar has set the temporary lintel 5 can be removed under safe and controlled conditions. The downward thrust, indicated by arrows T in Fig. 6, exerted by the superior masonry on either the temporary support zone Z or the horizontal lintel flange section 6 enables this approach to be taken. It is the load that locks the masonry into place preventing any rotation of the supported brick on the reduced load bearing area.

The location of the fixing apertures 7 to correspond to a mortar bed makes for easier, therefore more accurate, drilling of the holes 8. The reinstatement of fixing holes 8 is achieved not only more efficiently but also in an aesthetically more acceptable manner than with the aforementioned prior methods.

With the opening O made, and the brickwork above it supported by the permanent final lintel L, the patio door D can be fitted into the opening in the usual manner as shown in Fig. 5.

When working with a solid, ie non-cavity, wall a single temporary lintel clamped against one side of the wall may suffice. Whether or not this is so depends on the stability of the wall structure.

With unstable masonry, and for example in the case of stone walls, the temporary lintel(s) may be fixed directly to stone walls by suitable masonry fixing bolts, such as expansion-type "Rawlbolts". This would be additional to the through bolts and, for example, alternate holes 7 might be used for the through bolts 9 and the others for masonry fixing bolts. Further holes may be provided suitably sized and specifically for direct masonry fixing, the "adjustability" of large over-sized holes not for this being required.

A template, which lies flush against the wall, may be provided for use in chasing the grooves engaged by the supportive flanges of the temporary lintels. Such a template may be designed to guide a grinding wheel to form a suitable straight groove.

The two leaves of a cavity wall may need to be stepped to accommodate a through permanent lintel with differing internal and external top heights. The formation of the temporary lintels of the invention, and/or the mode of fixing, may accordingly be such that the wall supporting flanges thereof can be vertically offset on opposite sides of a wall as required.

CLAIMS:

1. A method of making or enlarging an opening in a wall, wherein a horizontal groove is cut in the wall which leaves a temporary support zone for the wall above the groove and a temporary lintel is held against at least one side of the wall, by means of bolts passing through the wall and the lintel (or masonry fixing bolts), with a projecting flange (or other supportive projection or projections) of the temporary lintel engaged in said groove, and thereafter with the wall so supported a permanent lintel is fitted.
2. A method according to claim 1, wherein the permanent lintel is fitted prior to making the full width final opening through the wall.
3. A method according to claim 1 or claim 2, wherein the supportive flange of the temporary lintel engages in the mortar joint below a course of building elements from which the wall is built.
4. A method according to claim 3, wherein the mortar joint is cut away to a depth not greater than half the thickness of said building elements to provide said groove.
5. A method according to any one of the preceding claims, wherein a single supportive projection of the temporary

lintel takes the form of a bottom edge flange extending the full horizontal length of that lintel.

6. A method according to any one of the preceding claims, wherein the temporary lintel extends over the full width of the final opening and beyond each end of the permanent lintel when installed.

7. A method according to any one of the preceding claims, wherein the wall is a cavity wall and said temporary lintel is one of two such temporary lintels clamped together with the wall between them to form a stable beam, each temporary lintel having a projecting supportive flange engaging said groove cut in the corresponding side of the wall.

8. A method according to any one of the preceding claims, wherein fixing apertures in the or each temporary lintel are positioned substantially at the neutral axis thereof, and the fixing bolts pass through holes drilled through a mortar bed in the wall.

9. A method of making or enlarging an opening in a wall, substantially as herein particularly described with reference to the accompanying drawings.

10. Equipment in the form of or comprising temporary lintels for use in the method of any one of the preceding

claims.

11. Equipment according to claim 10, substantially as herein described.